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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,400	02/10/2004	Benjamin Arnette Lagrange	839-1383	9775

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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/774,400

Applicant(s)

LAGRANGE ET AL.

Examiner

Christopher Verdier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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The Office action mailed June 6, 2005 is hereby vacated, in light of the prior art cited in copending application 10/774,399.

### ***Specification***

The disclosure is objected to because of the following informalities: Appropriate correction is required.

Paragraph 12, which contains an initialed change in line 5, should be submitted as a replacement paragraph.

In paragraph 38, line 11, -- an -- should be inserted after “maintaining”.

In paragraph 54, line 3, “,” should be deleted.

Paragraphs 67, 68, and 69, which contain initialed changes, should be submitted as replacement paragraphs.

In paragraph 68, line 7, “contain” should be changed to -- contains --.

### ***Claim Objections***

Claims 7-8, 18-19, 26-27, and 29-40 are objected to because of the following informalities: Appropriate correction is required.

In claims 7-8, 18-19, and 26-27, line 2, “radius” should be changed to -- radii --.

In claim 29, line 5, -- said -- should be inserted after “in”.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, line 4, "each one" is indefinite, because it is unclear if this refers to the broach slots or the wheelpost.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-13, 21, 25, and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by United Kingdom Patent 677,142 (figures 1-2). Note the turbine comprising an unnumbered wheel (the rotor disc) having plural unnumbered broach slots (which complement the firtree shape of the blade roots 1), each having an unnumbered interleaved system of fillets and tangs (which complement the firtree shape of the blade roots 1), plural unnumbered buckets each having a corresponding interleaved system of unnumbered fillets and tangs 4 so that the plural buckets can be fitted, one to one, into the plural broach slots on the wheel, with the interleaved system of fillets and tangs on the buckets and unnumbered wheelposts inherently acting to reduce stresses acting on the fitted buckets and wheelposts (due to the firtree shape), the fillets and tangs of the interleaved system of fillets and tangs each being formed by a combination of

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curved and straight surfaces, with the fillets formed on the plural buckets and the fillets formed on the plural wheelposts having angles of 55 degrees. There may be three interleaved tangs. Each of the wheelposts includes two unnumbered straight surfaces (which complement the firtree shape of the blade roots 1).

Claims 10-17, 21-25, and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Goodwin 4,260,331. Note the turbine comprising a wheel 15 (the rotor disc) having plural broach slots 17, each having an interleaved system of fillets and tangs (corresponding to the fillets 32 of the blade roots 18 and tangs 22 of the blade roots 18), and plural buckets 16 each having a corresponding interleaved system of fillets 32 and tangs 22 so that the plural buckets can be filled, one to one, into the plural broach slots, with the interleaved system of fillets and tangs on the buckets and unnumbered wheelposts (near 15 in figure 2 and located between adjacent slots 17) inherently acting to reduce stresses acting on the fitted buckets and wheelposts (due to the firtree shape), the fillets and tangs of the interleaved system of fillets and tangs each being formed by a combination of curved and straight surfaces, with the fillets formed on the plural buckets and the fillets formed on the plural wheelposts having angles of 54 degrees (the table in column 3, examples 7 and 8). Although the buckets and wheelposts have seven interleaved tangs and fillets (the table in column 3, examples 7 and 8), the buckets and wheelposts meet the limitation of having three interleaved tangs and fillets. As seen in figure 2, each of the buckets has a bottommost tang formed from unnumbered curved surfaces having more than one radius of curvature (at the bottom of the tang and the top of the tang). As seen in figure 3, each buckets has straight surfaces 29, 30. As seen in figure 2, each of the wheelposts

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has an unnumbered bottom fillet near 35 formed from curved surfaces having more than one radius of curvature (at the bottom and at the top). Each wheelpost includes unnumbered straight surfaces corresponding to the straight surfaces 29, 30 of the buckets.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill 2,755,062. Hill discloses a turbine comprising a wheel 12 having broach slots 15 with the wheel material between each adjacent pair of slots forming a wheelpost 18a, each one having an interleaved system of fillets and tangs shown generally at 22,

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23, buckets 6 each having a corresponding interleaved system of fillets and tangs 7 so that the buckets can be fitted one to one into the broach slots on the wheel, with the interleaved system of fillets and tangs on the buckets and wheelposts inherently acting to reduce stresses acting on the fitted buckets and wheelposts, due to the firtree shape.

However, Hill does not disclose that there are sixty broach slots and sixty buckets.

Rather, there are seventy two counted broach slots and buckets.

The number of the broach slots and buckets being sixty is deemed to be a matter of choice in design. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to reduce the number of broach slots and buckets in the turbine of Hill to a smaller number, such as sixty, for the purposes of reducing the rotating weight of the turbine, and adjusting the output of the turbine for differing applications.

Claims 3-8, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill 2,755,062 as applied to claim 2 above, and further in view of Johnson 5,147,180. The modified turbine of Hill shows all of the claimed subject matter, including the buckets 6 having unnumbered straight surfaces and the wheelposts 18a having unnumbered straight surfaces, but does not show the buckets having a bottom tang formed from curved surfaces having more than one radius of curvature (claim 3), does not show the wheelposts having a bottom fillet formed from curved surfaces having more than one radius of curvature (claim 5), does not show the curved surfaces of the bucket bottom tang having radii

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of curvatures of .3762 inches and .5556 inches (claim 7), and does not show the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches (claim 8).

Johnson shows a turbine blade 10 having unnumbered buckets, with the buckets having a bottom tang 32 formed from curved surfaces having more than one radius of curvature R11, R12, with wheelposts (see figure 2) having a bottom fillet formed from curved surfaces having more than one radius of curvature that complement the radius of curvature R11, R12, for the purpose of minimizing peak blade root and groove stresses.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified turbine of Hill such that the buckets have a bottom tang formed from curved surfaces having more than one radius of curvature, and such that the wheelposts have a bottom fillet formed from curved surfaces having more than one radius of curvature, as taught by Johnson, for the purpose of minimizing peak blade root and groove stresses.

The recitation in claim 7 of the curved surfaces of the bucket bottom tang having radii of curvatures of .3762 inches and .5556 inches, and the recitation in claim 8 of the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches are deemed to be matters of choice in design. The radii of curvature of curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet are recognized by Johnson to be result-effective variables which, when optimized, reduce the stresses in the blade roots and the grooves. It would have



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been further obvious at the time the invention was made to a person having ordinary skill in the art to select the radii of curvature of the curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet to be specific values, such as .3762 inches and .5556 inches for the bucket bottom tang, and such as .3822 inches and 0.5616 inches for the wheelpost bottom fillet, for the purpose of reducing the stresses in the blade roots and the grooves, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 9, as far as it is definite and understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hill 2,755,062 as applied to claim 1 above, and further in view of Caruso 6,030,178. The modified turbine of Hill shows all of the claimed subject matter as set forth above, including wheelposts 18a, but does not show that the outer tang edge of each wheelpost is scalloped so as to reduce the weight of the turbine wheel.

Caruso (figure 1) shows a turbine wheel 10 having wheelposts shown generally at 12, which are formed such that an unnumbered outer tang edge of each wheelpost is scalloped, for the inherent purpose of reducing weight of the turbine wheel.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified turbine of Hill such that the outer tang edge of each wheelpost is scalloped, as taught by Caruso, for the purpose of reducing weight of the turbine wheel.

Claims 14-19, 22-24, 26-27, and 31-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over United Kingdom Patent 677,142 in view of Johnson 5,147,180. United Kingdom Patent 677,142 discloses a turbine substantially as claimed as set forth above, with the buckets including straight surfaces, and the wheelposts including straight surfaces, but does not disclose the buckets having a bottom tang formed from curved surfaces having more than one radius of curvature (claims 14 and 22), does not disclose the wheelposts having a bottom fillet formed from curved surfaces having more than one radius of curvature (claims 16 and 24), does not disclose the curved surfaces of the bucket bottom tang having radii of curvatures of .3762 inches and .5556 inches (claims 18, 26, and 33), does not disclose the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches (claims 19 and 27), does not disclose the bucket having a bottom tang formed from curved surfaces having more than one radius of curvature (claim 31), does not disclose the bucket having an upper tang formed from curved surfaces having more than one radius of curvature (claims 34-35), and does not disclose the bucket having an intermediate tang formed from curved surfaces having more than one radius of curvature (claims 37-39).

Johnson shows a turbine blade 10 having unnumbered buckets, with the buckets having a bottom tang 32 formed from curved surfaces having more than one radius of curvature R11, R12, with wheelposts (see figure 2) having a bottom fillet formed from curved surfaces having more than one radius of curvature that complement the radius of curvature R11, R12, and with an upper tang 28 formed from curved surfaces having more than one radius of curvature R3, R4,

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and with an intermediate tang 30 formed from curved surfaces having more than one radius of curvature R7, R8, for the purpose of minimizing peak blade root and groove stresses.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the turbine of United Kingdom Patent 677,142 such that the buckets have the bottom tang formed from curved surfaces having more than one radius of curvature, such that the wheelposts have the bottom fillet formed from curved surfaces having more than one radius of curvature, such that the upper tang is formed from curved surfaces having more than one radius of curvature, and such that the intermediate tang is formed from curved surfaces having more than one radius of curvature, as taught by Johnson, for the purpose of minimizing peak blade root and groove stresses.

The recitation of the curved surfaces of the bucket bottom tang having radii of curvatures of .3762 inches and .5556 inches, and the recitation of the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches are deemed to be matters of choice in design. The radii of curvature of curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet are recognized by Johnson to be result-effective variables which, when optimized, reduce the stresses in the blade roots and the grooves. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select the radii of curvature of the curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet to be specific values, such as .3762 inches and .5556 inches for the bucket bottom tang, and such as .3822 inches and 0.5616 inches for the wheelpost bottom fillet, for the purpose of reducing the stresses in the

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blade roots and the grooves, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 18-19, 26-27, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodwin 4,260,331. Goodwin discloses a turbine substantially as claimed as set forth above, but does not disclose the curved surfaces of the bucket bottom tang having radii of curvatures of .3762 inches and .5556 inches (claims 18, 26, and 33), and does not disclose the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches (claims 19 and 27).

The recitation of the curved surfaces of the bucket bottom tang having radii of curvatures of .3762 inches and .5556 inches, and the recitation of the wheelpost bottom fillet having radii of curvatures of .3822 inches and 0.5616 inches are deemed to be matters of choice in design. The radii of curvature of curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet are known in the art to be result-effective variables which, when optimized, reduce the stresses in the blade roots and the grooves. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select the radii of curvature of the curved surfaces of the bucket bottom tang and of the wheelpost bottom fillet to be specific values, such as .3762 inches and .5556 inches for the bucket bottom tang, and such as .3822 inches and 0.5616 inches for the wheelpost bottom fillet, for the purpose of reducing the stresses in the blade roots and the grooves, since it has been held that discovering an optimum value of a result

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effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over United Kingdom Patent 677,142 in view of Caruso 6,030,178. The United Kingdom Patent 677,142 discloses a turbine substantially as claimed as set forth above, including unnumbered wheelposts, but does not disclose that the outer tang edge of each wheelpost is scalloped so as to reduce the weight of the turbine wheel.

Caruso (figure 1) shows a turbine wheel 10 having wheelposts shown generally at 12, which are formed such that an unnumbered outer tang edge of each wheelpost is scalloped, for the inherent purpose of reducing weight of the turbine wheel.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the turbine of United Kingdom Patent 677,142 such that the outer tang edge of each wheelpost is scalloped, as taught by Caruso, for the purpose of reducing weight of the turbine wheel.

### ***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

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A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, and 40 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, and 40 of copending Application No. 10/774,399. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented. Independent claim 10 of the copending application 10/774,399 recites that the fillets formed on the plural buckets have angles ranging from 50 to 59 degrees, independent claim 11 of the copending application 10/774,399 recites that the fillets formed on the plural wheelposts have angles ranging from 50 to 59 degrees, and independent claim 29 of the copending application 10/774,399 recites that the angles of the fillets formed in the bucket range from 50 to 59 degrees. Independent claim 10 of the instant application recites that the fillets formed on the plural buckets have angles ranging from 50 to 57 degrees, independent claim 11 of the instant application recites that the fillets formed on the plural wheelposts have angles ranging from 50 to 57 degrees, and independent claim 29 of the instant application recites that the angles of the fillets formed in the bucket range from 50 to 57 degrees. All of the corresponding claims in both applications are otherwise verbatim, with claim 10 of the copending application claiming wheelposts, which are the same as the broach slots claimed in claim 10 of the instant application. Because the claimed range of 50 to 57 degrees in the instant application falls within the claimed range of 50 to 59 degrees in the copending application 10/774,399, the claims conflict and are

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therefore considered to claim the same invention as recited in the claims of copending application 10/774,399.

***Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Melenchuk is cited to show a turbine rotor with one hundred two broach slots.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.  
June 10, 2005

  
Christopher Verdier  
Primary Examiner  
Art Unit 3745